LEAD REMOVAL WORK PLAN

Indoor Firing Range
Building 9
Hardesty Federal Complex
Kansas City, Missouri

Terracon Project No. 02027042
September 9, 2002

Prepared for:

US General Services Administration
Kansas City, Missouri

Prepared by:

Terracon

Terracon

STATE OF MISSOURI
Bob Holden, Governor • Stephen M. Mahfood, Director
DEPARTMENT OF NATURAL RESOURCES
www.dnr.state.mo.us

February 24, 2003

Mr. David Hartshorn
General Services Administration
1500 Bannister Road, Room 2135
Kansas City, MO 64131-3088

RE: Federal Center Facility, 607 Hardesty Avenue, Kansas City, Missouri

Dear Mr. Hartshorn:

I received your email on February 20, 2003, regarding the approval of the Lead Abatement Plan, Building 4 Underground Storage Tanks (UST) and Building 3A USTs. These remedial action plans will be utilized to show potential buyers the Missouri Department of Natural Resources (department) has reviewed and approved these plans.

The lead abatement plan does not list the dimensions or size of the firing range. These dimensions are listed in the Site Inspection report. Please provide a diagram of the firing range with the dimensions drawn on the diagram. Were the walls tested to see if lead contamination is in the paint? The site inspection report states the walls are painted cinder blocks. If the paint is lead based the sampling results may be erroneous. Otherwise the work plan is approved for implementation.

The Building 4 Underground Storage Tanks are regulated tanks. This plan was submitted to the Tanks Section of the department. Mr. Eric Tse, Project manager in the Tanks Section, asked me to oversee this plan as well as the unregulated tanks at this site. He has no objections to the draft remedial action plan as written. This remedial action plan is also approved for implementation.

The Building 3A Underground Storage Tanks are unregulated tanks. The Voluntary Cleanup Program (VCP) has been providing oversight of these tanks. The required plans as outlined in Section 7.4 of the remedial action plan will need to be submitted and approved by the VCP prior to any field activities. An underground injection permit will also need to be submitted to the Water Pollution Control Program (WPCP) prior to remediation. It takes time to acquire an injection permit from WPCP so please allow adequate time before remediation. This draft remedial action plan for the three USTs near Building 3A is approved for implementation.

The department is aware a prospective purchaser may conduct the remediation as outlined in the Early Transfer Authority and Covenant Deferral Request. The VCP would like to be notified as soon as possible if a potential buyer for the site proposes doing the remediation. The final remedial action plan would need to be submitted by the person doing the remediation. This plan may be different than the one outlined by the draft remedial action plan.

If you have any questions please contact me at 573-761-7538 or P.O. Box 176, Jefferson City, Missouri 65102-0176.

Sincerely,

HAZARDOUS WASTE PROGRAM

Christine O'Keefe
Environmental Specialist
Voluntary Cleanup Section

CO:ph

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This plan has been developed to comply with the Occupational Safety and Health Administration (OSHA) Construction Lead Standard, 29 Code of Federal Regulations (CFR) 1926.62.

1.0 LOCATION OF PROJECT

This job will take place at the indoor firing range located in Building 9 of the Hardesty Federal Complex at 601-607 Hardesty Avenue, Kansas City, Missouri. Terracon collected and analyzed wipe samples from surfaces in the firing range and bulk samples of the sand in the pit below the bullet stop. The surfaces of the range, bullet stop, and sand pit were found to be contaminated with lead as a dust or bulk fragments and represent a hazard to workers who may disturb it during component removal, lead hazard control, or renovation activities.

2.0 SCOPE OF WORK

The job will involve the removal of the sand in the pit and cleaning of the bullet stop, pit, floors, walls, and ceiling. The removal and clean up activities are expected to generate lead-containing dust.

The Contractor shall have proper knowledge of the conditions for the project along with the Contract Documents and is responsible for verifying the quantities and locations of all work to be performed as outlined in this section. Failure to do so shall not relieve the Contractor of his obligation to furnish all materials and labor necessary to carry out the provisions of the Contract. An Owner's Representative will be at the job site throughout all phases of the work.

The Contractor will furnish all labor, supervision, materials, services, insurance, and equipment necessary for the total removal of all identified areas of lead contamination and lead-contaminated debris associated with those portions of the project site.

The Contractor will consult Section 4.0 Description of Work and the lead contamination listing in Section 3.1 as a guide and will visit the site to assess the extent of physical difficulty involved in the complete removal of the lead contamination.

The Contractor will seal off the internal work zones of the site with 6 mil polyethylene critical and full containment barriers according to the provisions of Section 3.2, erect a worker decontamination chamber with air locks, and install HEPA filtration systems capable of changing all air in the full containment at least once each fifteen (15) minutes. The Contractor shall use full containment techniques, wet methods, and HEPA vacuums for the removal of any associated debris from the work areas.

The Contractor shall dispose of all lead contamination and lead-contaminated debris as hazardous waste in a safe and approved manner in compliance with all applicable Federal, State and local statutes, laws, rules, regulations and requirements, and provide the Owner with the disposal records. In the event that procedural questions not covered by this job specification arise, the Contractor will be guided by the overall purpose of the scope of work. Intentional or willful violations of these job specifications will be grounds for immediate termination of the contract and possible assessment of damages.

The Contractor shall remove all lead contamination from the specified areas and leave those areas of the site in a condition free of lead contamination and lead-contaminated debris.

3.0 LEAD CONTAMINATION

3.1 Sample Results

The results of wipe and bulk samples for lead are provided below. Concentration units are micrograms per square foot ($\mu g/ft^2$) for the wipe samples or milligrams per liter (mg/L) for bulk samples.

Lead Sample Results

Sample Type	Location	Concentration
Wipe	Floor, looking at range, left, 2 feet back	42,000.0 µg/ft^2
Wipe	Floor, looking at range, right, 2 feet back	92,000.0 µg/ft^2
Wipe	Floor, range center, 45 feet back	6,400.0 µg/ft^2
Wipe	Floor, range center, 70 feet back	2,400.0 µg/ft^2
Wipe	Wall, left, 3 feet back	1,300.0 µg/ft^2
Wipe	Wall, right, 3 feet back	280.0 µg/ft^2
Wipe	Wall, 4 pillars back (approximately 70 feet), 1 foot off floor	20.0 µg/ft^2
Wipe	SAA (right)	10.0 µg/ft^2
Bulk	Sand – left	554.0 mg/L
Bulk	Sand – center	610 mg/L
Bulk	Sand – right	604 mg/L

3.2 General Removal Procedures

The following general abatement procedures will be utilized for each area of the project:

a. Initial emphasis for the process of decontamination should be placed on the cleaning, containment, removal, and disposal of contaminated substrates.

a. Contractor shall construct critical and full containment barriers throughout appropriate areas. Barriers are to consist of 6-mil polyethylene (poly) sheeting on critical barriers. Attach worker decontamination unit, waste pass-out chamber, and place HEPA filtration system inside containment area. HEPA filter-equipped negative air machines will be used. The exhaust will not be located near any building fresh air supply intake. A manometer shall be supplied, calibrated, and installed by the contractor. A negative pressure of -0.02 inches of water shall be maintained throughout the project, until final visual clearance is achieved. The Contractor shall provide a manometer to constantly measure negative pressure relative to outside the containment.

b. Contractor shall mark the work area perimeters with caution tape and post notifications and barriers. Protected pathways for regular access of remediation personnel and transportation of contaminated material to and from the work area must be established. Access routes should not pass through cleaned areas.

c. The electrical power shall be isolated and locked out or de-energized before the commencement of removal operations. All electrical devices and tools shall be equipped with Ground Fault Circuit Interrupters (GFCI). The GFCI shall be placed as close to the tool as feasible.

d. Owner's Representative shall visually inspect and approve the containment methods prior to Contractor starting any removal activities.

e. All surfaces will be vacuumed with a HEPA vacuum, followed by wet washing with special cleaning agents and rinsing, followed by a final pass with the HEPA vacuum. Surfaces include ceilings, walls, floors, doors, heating, ventilation, and air conditioning (HVAC) equipment (heating diffusers, radiators, pipes, vents), fixtures of any kind (lights, built-in cabinets, and appliances). All rooms and surfaces will be included in the HEPA vacuum process except those that were found not to have lead hazards and that were properly separated from work areas before the process began. Vacuuming will begin on the ceilings and end on the floors, sequenced to avoid passing through areas already cleaned, with the entryway cleaned last. All vacuumed surfaces will be thoroughly and completely washed with a lead-specific cleaning agent (or equivalent) and rinsed with clean water (energized electrical systems will not be washed). Select a detergent that does not damage existing surface finishes. Mix according to the manufacturer's instructions. Five gallons of the mixture should be used to clean no more than 1,000 square feet. The used cleaning mixture is potentially hazardous waste. Wash water should be assumed to be hazardous waste until proper testing by a certified laboratory shows levels below regulatory limits. No liquid waste generated on the site shall be disposed of at the site. On site drains may not be utilized. After the preliminary final cleaning effort is completed, the Owner's Representative will visually evaluate the entire work area to ensure that all work has been completed and all visible dust and debris have been removed.

f. Effectiveness of final cleanup will be determined through surface wipe sampling. Surface concentrations of lead after cleanup should not exceed 200 $\mu g/ft^2$. This level is based upon an OSHA compliance instruction (CPL 2-2.58) for the construction industry, which provides a level of acceptable lead loading for non-lead work areas.

4.0 DESCRIPTION OF WORK

The work specified herein shall be the complete cleaning of all specified lead-contaminated surfaces (Section 3.1) and removal of associated lead-contaminated sand and debris. The work will be performed by competent persons trained, knowledgeable, and qualified in the techniques of remediation, handling, and disposal of lead contamination and the subsequent cleaning of internal contaminated areas. These competent persons must comply with all applicable Federal, State and local regulations and be capable of and willing to perform the work of this Contract.

The Contractor shall supply all labor, supervision, materials, services, insurance, permits and equipment necessary to carry out the work in accordance with all applicable Federal, State, and local regulations and these specifications.

Contractor shall examine the site and verify that there are no known "special conditions" which must be considered by the Contractor when performing the lead contamination abatement (e.g., high temperatures, equipment that must remain in operation, other toxic substances in the air, high ceilings, or contaminated surfaces or fixtures). Any failure by the Contractor to identify "special conditions" will not relieve him from the responsibility for estimating properly the difficulty or cost of successfully performing the work.

Final clearance wipe sampling will be conducted by the Owner's Representative. The results of the final clearance wipe sampling will be made available to the Contractor.

5.0 CONTRACTOR SUBMITTALS

All submissions shall be made to the Owner's Representative.

5.1 Submittals before Remediation.

a. Submit satisfactory proof that required permits/letters have been obtained and that disposal site location and arrangements for transportation of lead-contaminated waste materials have been made. If a separate transporter (other than the Contractor) is to be employed to transport the lead-contaminated waste to the hazardous waste disposal facility, copies of the transporter's licenses and permits shall be submitted to Owner's Representative.

b. Submit documentation from a physician that all employees or agents who may be exposed to airborne lead contamination in excess of 30 micrograms per cubic meter ($\mu g/m^3$) have been provided with an opportunity to be medically monitored to determine whether they are physically capable of working while wearing the respirator required without suffering adverse health effects. The Contractor must be aware of and provide information to the examining physician about unusual conditions in the workplace environment (i.e., high temperatures, humidity, or chemical contaminants) that may affect the employee's ability to perform work activities.

c. Submit shop drawings for layout and construction of decontamination enclosure system and barriers for isolation of the work area, as appropriate. Drawings shall indicate location of individual HEPA filtration systems and their respective exhausting locations.

d. Submit manufacturer's certification that HEPA vacuums and HEPA filtration units and any other local exhaust ventilation equipment conform to ANSI standards.

e. When rental equipment is to be used in remediation areas or to transport lead-contaminated waste, a written notification concerning intended use of the rental equipment must be provided to the rental agency with a copy submitted to the Owner's Representative.

f. Document NIOSH approvals for all respiratory protective devices used on-site. Include manufacturer certification of HEPA filtration capabilities for all cartridges and filters.

g. Provide information regarding the crew size and employee responsibilities.

h. Submit documentation of respirator fit testing for all Contractor employees and agents who must enter the regulated area. This fit-testing shall be in accordance with qualitative procedures as detailed in the OSHA Respiratory Protection standard 29 CFR 1910.134 Appendix C, Qualitative Fit Test Protocol or be quantitative in nature.

i. Submit documentation that all Contractor employees and agents participate in a medical surveillance program as required by OSHA's Construction Lead standard (29 CFR 1926.62) and are not under Medical Removal Protection.

j. Submit documentation that all Contractor employees and agents have received training required under OSHA's Construction Lead standard, 29 CFR 1926.62.

k. If Contractor will not be performing initial exposure monitoring during this lead abatement project, submit documentation that initial exposure monitoring has been performed for a similar project.

l. Submit a detailed implementation schedule of total project duration with phasing and milestones noted.

5.2 During Abatement Activities

a. Submit job progress reports detailing remediation activities as requested by the Owner's Representative. Include review of program with respect to previously established milestones and schedules, major problems and action taken, injury reports, equipment breakdown and all bulk material and air sampling results conducted by Contractor.

b. Submit copies of all transport manifests, hazardous waste manifests, trip tickets, and disposal receipts for all lead-contaminated waste materials removed from the work area during the abatement process.

c. Submit daily, copies of worksite entry logbooks with information on worker and visitor access.

d. Submit logs documenting filter changes on respirators, HEPA vacuums, HEPA filtration ventilation units, and other engineering controls.

e. Post in the clean room area of the worker decontamination unit a list containing the names, addresses, and telephone numbers of the Contractor, the Owner, the Owner's Representative, the General Superintendent, emergency support/facilities and any other personnel who may be required to assist during remediation activities.

6.0 STOP WORK

If the Owner's Representative presents a written stop work order, the Contractor shall immediately and automatically stop all work. Do not recommence work until authorized in writing by Owner's Representative.

7.0 SITE USE

a. During the entire abatement period, the Contractor shall have the use of the project site for construction operations 12 hours a day per each working day. Contractor must confine operations at the site to the areas permitted under the Contract. Portions of the site beyond areas on which work is indicated are not to be disturbed except as necessary to insure the safety of those present at or near the site. The Contractor shall conform to site rules and regulations affecting the work while engaged in project construction.

b. Keep existing driveways and entrances serving the premises clear and available to the Owner and his employees at all times. Do not use these areas for parking or storage of materials without prior consent from Owner.

c. Do not unreasonably encumber the site with materials or equipment. Storing of materials is to be approved by Owner in advance. Confine stockpiling of materials to the areas indicated by the Owner. If additional storage is necessary, obtain and pay for such storage off site.

8.0 SITE SECURITY

a. The negative pressure enclosure (NPE) area is to be restricted only to authorized, trained, and protected personnel. This may include the Contractor's employees, Owner's Representative, and employees of Federal, State, and local agencies, and any other designated individuals. A list of authorized personnel shall be established before job start and posted in the clean room of the worker's decontamination area or at the entrance to the project site.

b. Entry into the NPE by unauthorized individuals shall be reported immediately to the Owner's Representative by the Contractor.

c. A logbook shall be maintained by the Contractor in the clean room of the worker decontamination area. Anyone who enters the NPE must record name, affiliation, time in, and time out for each entry.

d. Access to the NPE shall be through a single worker decontamination system. All other means of access (doors, windows, hallways, etc.) shall be blocked or locked to prevent

entry to or exit from the work area. The only exceptions for this rule are the waste pass-out airlock, which shall be sealed except during removal of containerized lead-contaminated waste from the NPE and emergency exits in case of fire or accident. Emergency exits shall not be locked from the inside. However, they shall be sealed with polyethylene sheeting and tape until needed.

e. The Contractor shall control site security during ongoing lead remediation whenever possible, in order to protect work efforts and equipment.

f. The Contractor will have Owner/Responsible Party's assistance in notifying building/site occupants of impending activity and enforcement of restricted access by Owner/Responsible Party's employees.

9.0 EMERGENCY PLANNING

a. Emergency planning (Health and Safety Plan) shall be developed before remediation initiation and agreed to by Contractor, Owner, and Owner's Representative.

b. Emergency procedures shall be prepared by Contractor in written form and prominently posted in the clean room of the worker decontamination area.

c. Emergency procedures shall include written notification of police, fire, and emergency medical personnel of planned abatement activities, work schedule, and layout of work area, particularly barriers that may affect response capabilities.

d. Emergency planning shall include considerations of spills, containment breach, fire, explosion, toxic atmospheres, electrical hazards, slips, trips and falls, and heat related injury. Written procedures shall be developed and employee training in procedures shall be provided.

e. Employees shall be trained in evacuation procedures in case of workplace emergencies.

f. For non life-threatening situations - Employees injured or otherwise incapacitated shall decontaminate following normal procedures with assistance from fellow workers, if necessary, before exiting the work place to obtain proper medical treatment.

g. Telephone numbers of all emergency response personnel (including environmental substance agencies) shall be prominently posted in the clean room, along with the location of the nearest telephone and the location of the nearest hospital. There must be a telephone available for emergency use at all times. There is no telephone on site, the Contractor must provide one at his expense. A cell phone may be used if it is tested first to ensure that local emergency numbers may be reached from the site.

10.0 EQUIPMENT AND MATERIALS

10.1 Materials

a. Deliver all materials in the original packages, containers, or bundles bearing the name of the manufacturer and the brand name (where applicable).

b. Polyethylene sheeting for walls and stationary objects shall be a minimum of 6 mil thick.

c. Method of attaching polyethylene sheet shall be agreed upon in advance by the Contractor and Owner's Representative. Methods of attachment may include any combination of duct tape or other waterproof tape, furring strips, spray glue, staples, nails, screws or sheets of polyethylene and capable of sealing polyethylene to dissimilar finished or unfinished surfaces under both wet and dry conditions.

d. Polyethylene sheeting used for worker decontamination enclosure shall be opaque white or black in color.

e. Trisodium phosphate or equally effective detergent shall be used to remove lead from surfaces.

f. Disposal bags shall be of clear, 6 mil polyethylene.

10.2 Equipment

a. A sufficient quantity of HEPA filtration units equipped with multi-stage HEPA filtration and operated in accordance with ANSI standards (local exhaust ventilation requirements) and EPA guidance. The HEPA filtration units shall provide at least one work area air change every 15 minutes.

To calculate total air flow requirement:

Total cubic feet of work area divided by 15 minutes = total cubic feet/minute (cfm)

To calculate the number of units needed for the abatement:

Number of units needed = (total cfm) divided by (capacity of unit in cfm)

b. Each HEPA filtration machine must have a minimum of 1,800 to 2,000 cfm capacity.

c. Each HEPA filtration machine that is utilized on the project shall be tested/certified before the start of work. This test is intended to ensure that air does not bypass or leak around the HEPA filter assembly within the HEPA filtration machine.

d. Each HEPA filtration machine shall have a backdraft damper installed on the discharge of the machine. Dampers shall be properly fitted to the equipment using a 20-gauge sheet metal transition fitting or poly sheeting.

e. Personal respiratory protection shall be provided by the Contractor to each of its workers and shall be appropriate to the airborne concentrations of lead expected to occur during abatement operations. The Contractor shall be solely responsible for any/all fit testing, medical surveillance, and record keeping.

f. Full body disposable protective clothing, including head, body and foot coverings (unless using reusable/cleanable footwear) consisting of material impenetrable by lead contamination will be provided to authorized visitors in sizes adequate to accommodate movement without tearing.

g. Additional safety equipment (e.g. hard hats meeting the requirements of ANSI Standard Z87.1-1986, eye protection meeting the requirements of ANSI Standard Z87.1-1989, safety shoes meeting the requirements of ANSI Standard Z41.1-1991, disposable PVC gloves), shall be provided as necessary to all workers and authorized visitors.

h. Non-skid footwear shall be provided to all abatement workers. Disposable clothing shall be adequately sealed to the footwear to prevent body contamination.

i. A sufficient supply of disposable mops, rags, and sponges for regulated area decontamination shall be available.

10.3 Removal Equipment

a. A sufficient supply of scaffolds, ladders, lifts, and hand tools (e.g. scrapers, wire cutters, brushes, utility knives, wire saws, etc.) shall be provided as needed and shall be erected or set-up and maintained in a safe manner.

b. Rubber or plastic dustpans, shovels, and squeegees shall be provided for cleanup.

c. A sufficient supply of HEPA filtered vacuum systems shall be available during the lead contamination removal and cleanup

10.4 Substitutions

10.4.1 Pre-approval Required

a. The Contract is based on the materials, equipment, and methods described in the Contract Documents.

b. The Owner's Representative will consider proposals for substitutions of materials, equipment and methods only when such proposals are accompanied by full and complete technical data and all other information required by the Owner's Representative to evaluate the proposed substitution.

c. Do not substitute materials, equipment, or methods unless such substitution has been specifically approved for this work by the Owner's Representative.

10.4.2 "Or Equal"

a. Where the phrase "or equal" or "or equal as approved by the Owner" occurs in the Contract Document, do not assume that materials, equipment or methods will be approved by the Owner's Representative unless the item has been specifically approved for this work by the Owner's Representative.

b. The decision of the Owner or Owner's Representative shall be final.

11.0 CONTROL MEASURES

During sand removal, the sand will be wetted with water mist to reduce airborne dust generation. Wet methods (mopping) and HEPA vacuums will be used during cleaning to minimize worker exposures to lead. Final cleaning will be accomplished by three successive cleanings in this order: HEPA vacuuming; wet mopping with detergent solution; and HEPA vacuuming. The use of HEPA vacuums and wet cleaning methods will minimize worker lead exposures.

12.0 TECHNOLOGY CONSIDERED IN MEETING THE PERMISSIBLE EXPOSURE LIMIT

The only specialized equipment that will be used for this project are HEPA filtration units, HEPA vacuum cleaners, and portable pressure tanks for water misting of surfaces.

13.0 EXECUTION

13.1 Preparation

13.1.1 Work Area - General Requirements

a. This section applies to the construction of a Negative Pressure Enclosure (NPE).

b. Post warning signs and warning tape to demarcate the NPE or other approaches where lead contamination may be reasonably expected to exceed 30 $\mu g/m^3$.

c. Shut down and lock out electric power to the NPE. Make provisions to draw temporary power and lighting from outside the remediation area. Insure safe installation (including ground faulting) of temporary power sources and equipment by compliance with all applicable electrical code requirements and OSHA requirements for temporary electrical systems. All costs for electricity shall be paid by the Owner.

d. Seal off all windows, doorways, corridor entrances, drains, ducts, grates, diffusers, skylights, and any other openings leading into, out of, or through the NPE with 6 mil polyethylene sheeting and duct tape/spray adhesive (critical barrier).

e. Shut down and lock out HVAC system in the NPE. The Owner will provide assistance with the shut down procedures. For those openings in the NPE which are part of the heating, venting, and air conditioning (HVAC) system, one additional layer of 6 mil polyethylene sheeting shall be applied to those areas.

13.1.2 Worker Decontamination Area

a. The Worker Decontamination Areas shall be provided at locations as close as practically possible to the NPE. One system at a single location for each contained work area is preferred. The system may consist of existing rooms or areas outside of the work area, if the layout is appropriate, that can be enclosed in plastic sheeting, and are accessible from the work area. When this situation does not exist, enclosure systems may be constructed out of metal, wood, or plastic support as appropriate.

b. Plans for construction, including materials, shall be submitted as shop drawings and approved, in writing, by the Owner's Representative before work initiation. Such approval shall not release or relieve Contractor from its obligation to perform the work in accordance with the Contract documents or the terms thereof. Worker decontamination enclosure systems constructed at the worksite shall use 6 mil opaque black or white polyethylene sheeting or other acceptable materials for privacy. Detailed descriptions of portable, pre-fabricated units, if used, must be submitted for the Owner's Representative's approval. Plans must include a floor plan in relation to the abatement areas with dimensions, materials, size, thickness, plumbing and electrical utilities and waste pass out and storage areas.

c. The worker decontamination enclosure shall consist of, at least, a clean room, a change room, a shower room, and an equipment room; each separated from each other and from the work area by airlocks. Double disposable Tyvek suits with head and foot covering will be used. The outside suit will be HEPA vacuumed and left in the equipment room, and the second suit removed in the central change room.

d. Entry to and exit from all airlocks and decontamination enclosure system chambers shall be through curtained doorways consisting of three (3) sheets of overlapping polyethylene sheeting. One (1) sheet (#1) shall be secured at the top and left sides, the center sheet (#2) at the top and right side, and the third sheet (#3) secured to the top and left sides. The sheets shall have weights attached to the bottom to insure that they hang straight and maintain a seal over the doorway when not in use. Doorway designs, providing equivalent protection and acceptable to the Owner's Representative may be utilized.

e. Access between any two (2) rooms in the decontamination enclosure system shall be through an airlock with at least three (3) feet separating each curtained doorway. Pathways into (from clean to contaminated) and out from (contaminated to clean) the work area shall be clearly designated.

f. The clean room shall be sized to adequately accommodate the work crew. Benches shall be provided as well as hooks for hanging up street clothes (lockers may be provided for valuables, however, workers may be required to secure valuables in their cars). Shelves for storing respirators shall also be provided in this area. Clean work clothes (if required under disposable clothing), clean disposable clothing, replacement filters for respirators, towels and other necessary items shall be provided in adequate supply in the clean room. A location for postings shall also be used to permit access into the clean room from outside the work area. Lighting, heat and electricity shall be provided, as necessary, for comfort. This space shall not be used for storage of tools, equipment, or materials, (except as specifically designated) or as office space.

g. The equipment room shall be suited for storage of equipment and tools at the end of a shift after they have been decontaminated using HEPA filter vacuum and/or wet cleaning techniques as appropriate. Replacement filters (in sealed containers until used) for HEPA vacuums and HEPA filtration ventilation equipment, extra tools, and other materials and equipment that may be required during remediation may also be stored here. A pool or equivalent filled with water shall be located in the work area just outside the equipment room for workers to clean off foot coverings after leaving the work area and prevent excessive contamination of the worker decontamination enclosure system. A drum lined with a labeled 6 mil polyethylene bag for collection of disposable clothing may be located in this room. Contaminated footwear (e.g.

rubber boots, other reusable footwear) shall be stored in this area for reuse the following work day.

13.1.3 Waste Container Pass-Out Airlock

a. The waste container pass-out airlock shall be attached the NPE at a location near the waste disposal transport container.

b. This airlock system shall consist of an airlock, a container staging area, and another airlock with access to the NPE.

c. The waste container pass-out airlock shall be constructed in a similar fashion to the worker decontamination enclosure system using similar materials and airlock and curtain doorway designs.

d. This airlock system **shall not** be used to enter or exit the worksite.

13.1.4 Maintenance of the Negative Pressure Enclosure (NPE)

a. Following completion of the construction of all polyethylene barriers and decontamination system enclosures, allow settling to insure that barriers will remain intact and secured to walls and fixtures before beginning actual remediation activities.

b. The NPE shall be inspected prior to beginning removal work and then be inspected at least twice daily: prior to the start of each day's remediation activities and following the completion of the day's remediation activities. Document inspections and observations on separate sheet or in the daily project log.

c. Use smoke tubes to test and inspect the NPE.

d. Damage and defects in the NPE are to be repaired immediately upon discovery.

e. At any time during the abatement activities, if visible material is observed outside of the work area or if damage occurs to the NPE, work shall

immediately stop, repairs be made to barriers, and debris/residue cleaned up using appropriate HEPA vacuuming and wet mopping procedures.

f. Install and initiate operation of HEPA negative air filtration equipment as needed to provide one air change in the work area every fifteen (15) minutes. Openings made in the enclosure system to accommodate these units shall be made airtight with tape, spray adhesive, and/or caulking as needed. If more than one unit is installed, they should be turned on one at a time, checking the integrity of wall barriers for secure attachment and need for additional reinforcement. Insure that adequate power supply is available to satisfy the requirements of the ventilating units and other equipment. HEPA filtration units shall be exhausted to the outside of the building. They shall not be exhausted into occupied areas of the building. Location of the exhaust cannot be located near any building fresh air supply intakes. Twelve (12) inch extension ducting shall be used to reach from the work area to the exhaust area. Contractor shall insure that HEPA filters are changed regularly, filters are not obstructed or damaged, and that the exhaust ducting does not release lead into uncontaminated building areas.

g. A minimum of -0.02 column inches of water pressure differential, relative to outside pressure, shall be maintained within the NPE as evidenced by manometric measurements.

h. The NPE shall be kept under negative pressure throughout the period of its use.

13.1.5 Emergency Exits

Clearly identify and maintain emergency and fire exits from the work area. Emergency exits shall be established and clearly marked with duct tape arrows or other effective designations to permit easy visibility from anywhere within the work area. They shall be secured to prevent access from uncontaminated areas and still permit emergency exiting. These exits shall be properly sealed with polyethylene sheeting, which can be cut to permit egress if needed. These exits may be the worker decontamination enclosure, the waste pass-out airlock, and/or other alternative exits satisfactory to fire officials.

13.1.6 Work shall not commence until:

a. The NPE has been constructed and inspected for breaches and smoke-tested for leaks.

b. HEPA filtration ventilation systems are functioning adequately.

c. Electrical circuits in the NPE are deactivated unless equipped with ground-fault circuit interrupts.

d. All pre-work submissions, postings, and drawings have been provided and are satisfactory to the Owner's Representative.

e. All equipment for remediation, clean up and disposal is on hand and proven to be in operating order.

f. All worker training is completed and evidence thereof has been provided to Owner's Representative.

g. The Contractor receives written permission from the Owner or Owner's Representative to commence abatement.

14.0 WORKPLACE ENTRY AND EXIT PROCEDURES

14.1 General Requirements

14.1.1 All workers and authorized personnel shall enter the work area through the worker decontamination area.

14.1.2 All personnel who enter the NPE must sign the entry log, located in the clean room, upon entry and exit.

14.1.3 All personnel, before entering the NPE shall read and be familiar with all personal protection requirements (including workplace entry and exit procedures) and emergency procedures. A sign-off sheet shall be used to acknowledge that these have been reviewed and understood by all personnel before entry.

14.1.4 Worker Protection Procedures During Entry and Exit

a. All personnel shall proceed first to the clean room, remove all street clothes and appropriately don respiratory protection (as deemed adequate for the job conditions) and launderable and/or disposable coveralls, head covering and foot covering. Hard hats, eye protection, and gloves shall also be utilized, if required. Clean respirators and protective clothing shall be provided and utilized by each person for each separate entry into the work area.

b. Personnel wearing designated personal protective equipment shall proceed from the clean room through the shower room and equipment room to the NPE.

c. Before leaving the NPE, all personnel shall remove gross contamination from the outside of respirators and protective clothing by brushing and/or wet wiping procedures. (Only small HEPA vacuums with brush attachments may be utilized for this purpose, as larger machines may tear the suits.) Each person shall clean bottoms of protective footwear in the walk-off pan using brushes or other appropriate equipment just before entering the equipment room.

d. Personnel shall proceed to equipment room where they remove all protective equipment except respirators. Deposit disposable (or launderable) clothing into appropriately labeled impermeable containers for disposal (or laundering).

e. Reusable, contaminated footwear shall be stored in the equipment room when not in use in the work area. Upon completion of remediation, it shall be disposed of as lead-contaminated waste. Rubber boots, if used, may be decontaminated at the completion of remediation for reuse.

f. Still wearing respirators, personnel shall proceed to the shower area, clean the outside of the respirators and the exposed face area under running water prior to removal of respirator and shower and shampoo to remove residual lead contamination.

g. After showering and drying off, proceed to the clean room and don clean disposable (and/or launderable) clothing if there will be later re-entry into the regulated area or street clothes if it is the end of the work shift.

15.0 WASTE CONTAINER PASS-OUT PROCEDURES

a. Lead-contaminated waste that has been containerized shall be transported out of the work area through the waste container pass-out airlock (or through the worker decontamination enclosure if a separate airlock has not been constructed).

b. Waste pass-out procedures shall use two (2) teams of workers, an "inside" team and an "outside" team.

c. The inside team wearing appropriate protective clothing and respirators for inside the regulated area shall clean the outside, including bottom, of properly labeled, impermeable containers (bags, drums, or wrapped components) using HEPA vacuum and wet wiping techniques. The cleaned containers shall then be placed into the waste container pass-out airlock. No worker from the inside team shall further exit the NPE through this airlock.

d. The outside team shall receive the contaminated waste bags from outside the NPE and place waste bags. No worker from the outside team shall enter the NPE through this airlock.

e. The disposal bags are then loaded into the waste transport trailer.

f. The exit from this airlock shall be secured to prevent unauthorized entry.

16.0 WORKER PROTECTION

a. Requirements pursuant to applicable OSHA standards found in 29 CFR 1910 and 1926 must be followed.

b. A copy of the contractor's Safety & Health plan, specific to lead and lead remediation shall be provided to the Owner's Representative for review before the start of the project.

c. All workers entering the work area and/or handling potentially lead-contaminated debris will wear an appropriate NIOSH-approved respiratory protection. Additional personnel protective equipment (i.e. suits, hood, foot, and eye protection) should be

used as applicable. Protective garments will be removed and disposed of before leaving the work site.

d. All workers shall be provided with training that includes lead decontamination and procedures to minimize cross-contamination of non-remediation areas. Documentation of training shall be provided to the Owner's representative before beginning work.

e. Material safety data sheets (MSDS) must be available for all cleaning agents used.

17.0 ENVIRONMENTAL MONITORING REQUIREMENTS

17.1 Contractor Employee Exposure Monitoring

The Contractor is responsible for conducting employee exposure monitoring as necessary.

17.2 Barrier Isolation Integrity

At the start of each workday, the Contractor will visually check barrier isolation integrity (HEPA negative air machines, critical barriers). A minimum negative pressure of -0.02 inches of water shall be maintained in the containment during the project until clearance results have been received and approved by the Owner's representative.

17.3 Work Area Clearance

The Owner's representative will clear the remediation areas by visual inspection and wipe sampling. The effectiveness of final cleanup will be determined through surface wipe sampling. Surface concentrations of lead after cleanup should not exceed 200 $\mu g/ft^2$. This level is based upon an OSHA compliance instruction (CPL 2-2.58) for the construction industry, which provides a level of acceptable lead loading for non-lead work areas.

If the clearance level is not met, the Contractor shall reclean and repeat clearance sampling at their expense.

18.0 DEFINITIONS

Note: Not all of the definitions provided below may be relevant to this specific lead remediation project.

ABATEMENT: Reduction or elimination of lead contamination.

AIR HANDLING UNIT (AHU): For purposes of this document, refers to equipment that includes a blower or fan, heating and/or cooling coils, and related equipment such as controls, condensate drain pans, and air filters. Does not include ductwork, registers or grilles, or boilers and chillers.

AIR PASSAGES: Openings through or within walls, through floors and ceilings, and around chimney flues and plumbing chases, that permit air to move in and out of the conditioned spaces of the building.

AIRLOCK: A system for permitting ingress and egress with minimum air movement between a contaminated area and an uncontaminated area, typically consisting of two curtained doorways separated by a distance of at least 3 feet, such that one passes through one doorway into the airlock, allowing the doorway sheeting to overlap and close off the opening before proceeding through the second doorway, thereby preventing flow-through contamination.

BREATHING ZONE: Area of a room in which occupants breathe as they stand, sit, or lie down.

BUILDING ENVELOPE: Elements of the building, including all external building materials, windows, and walls that enclose the internal space.

CEILING PLENUM: Space below the flooring and above the suspended ceiling that accommodates the mechanical and electrical equipment and that is used as part of the air distribution system. The space is kept under negative pressure.

CENTRAL AIR HANDLING UNIT (CENTRAL AHU): This is the same as an air handling unit, but serves more than one area.

CERTIFIED INDUSTRIAL HYGIENIST (CIH): An individual certified in the comprehensive practice of industrial hygiene by the American Board of Industrial Hygiene.

CFM: Cubic feet per minute. The amount of air, in cubic feet, that flows through a given space in one minute. 1 CFM equals approximately 2 liters per second (L/s).

CHEMICAL SENSITIZATION: Evidence suggests that some people may develop health problems characterized by effects such as dizziness, eye and throat irritation, chest tightness, and nasal congestion that appear whenever they are exposed to certain chemicals. People may react to even trace amounts of chemicals to which they have become "sensitized."

CIH: See Certified Industrial Hygienist

CO: Carbon monoxide.

CO_2: Carbon dioxide.

CONDITIONED AIR: Air that has been heated, cooled, humidified, or dehumidified to maintain an interior space within the "comfort zone." (Sometimes referred to as "tempered" air.)

DECONTAMINATION AREA: An enclosed area adjacent and connected to the regulated area. Consists of an equipment room, shower area, and clean room separated by airlocks. Lead contamination is removed from workers, materials, and equipment in the decontamination area.

DIFFUSERS AND GRILLES: Components of the ventilation system that distribute and return air to promote air circulation in the occupied space. As used in this document, supply air enters a space through a diffuser or vent and return air leaves a space through a grille.

DRAIN TILE LOOP: A continuous length of drain tile or perforated pipe extending around all or part of the internal or external perimeter of a basement or crawlspace footing.

DRAIN TRAP: A dip in the drain pipe of sinks, toilets, floor drains, etc., which is designed to stay filled with water, thereby preventing sewer gases from escaping into the room.

ENVIRONMENTAL AGENTS: Conditions other than indoor air contaminants that cause stress, comfort, and/or health problems (e.g., humidity extremes, drafts, lack of air circulation, noise, and over-crowding).

EXHAUST VENTILATION: Mechanical removal of air from a portion of a building (e.g., piece of equipment, room, or general area).

HEPA FILTER: High efficiency particulate air (HEPA) filter capable of trapping and retaining 99.97% of particles greater than 0.3 micrometers in diameter.

HEPA FILTRATION SYSTEM: An air ventilation system utilizing HEPA filters that may or may not utilize a pressure differential relative to the work zone exterior.

HEPA FILTER VACUUM COLLECTION EQUIPMENT (VACUUM CLEANER): HEPA-filtered vacuum collection equipment with a filter system capable of collecting and retaining mold contamination.

HVAC: Heating, ventilating, and air-conditioning system.

MAKE-UP AIR: See "Outdoor Air Supply."

MECHANICALLY VENTILATED CRAWLSPACE SYSTEM: A system designed to increase ventilation within a crawlspace, achieve higher air pressure in the crawlspace relative to air pressure in the soil beneath the crawlspace, or achieve lower air pressure in the crawlspace relative to air pressure in the living spaces, by use of a fan.

NEGATIVE PRESSURE: Condition that exists when less air is supplied to a space than is exhausted from the space, so the air pressure within that space is less than that in surrounding areas. Under this condition, if an opening exists, air will flow from surrounding areas into the negatively pressurized space.

ORGANIC COMPOUNDS: Chemicals that contain carbon. Volatile organic compounds vaporize at room temperature and pressure. They are found in many indoor sources, including many common household products and building materials.

OSHA: Occupational Safety and Health Administration.

OUTDOOR AIR SUPPLY: Air brought into a building from the outdoors (often through the ventilation system) that has not been previously circulated through the system. Also known as "make-up air."

PERMISSIBLE EXPOSURE LIMIT (PEL): Workplace exposure standards set by OSHA.

PLENUM: Air compartment connected to a duct or ducts.

PM: Preventive Maintenance.

POSITIVE PRESSURE: Condition that exists when more air is supplied to a space than is exhausted, so the air pressure within that space is greater than that in surrounding areas. Under this condition, if an opening exists, air will flow from the positively pressurized space into surrounding areas.

PPM: Parts per million.

PREVENTIVE MAINTENANCE: Regular and systematic inspection, cleaning, and replacement of worn parts, materials, and systems. Preventive maintenance helps to prevent parts, material, and systems failure by ensuring that parts, materials, and systems are in good working order.

RE-ENTRAINMENT: Situation that occurs when the air being exhausted from a building is immediately brought back into the system through the air intake and other openings in the building envelope.

RE-ENTRY: Situation that occurs when the air being exhausted from a building is immediately brought back into the system through the air intake and other openings in the building envelope.

RECOMMENDED EXPOSURE LIMIT (REL): Recommended workplace exposure limits established by the National Institute for Occupational Safety and Health (NIOSH).

THRESHOLD LIMIT VALUE (TLV®): Workplace exposure guidelines established by the American Conference of Governmental Industrial Hygienists® (ACGIH®).

VARIABLE AIR VOLUME SYSTEM (VAV): Air handling system that conditions the air to constant temperature and varies the outside airflow to ensure thermal comfort.

VENTILATION AIR: Defined as the total air, which is a combination of the air brought inside from outdoors and the air that is being re-circulated within the building. Sometimes, however, used in reference only to the air brought into the system from the outdoors; this document defines this air as "outdoor air ventilation."

VENTILATION RATE: The rate at which indoor air enters and leaves a building. Expressed in one of two ways: the number of changes of outdoor air per unit of time (air changes per hour, or ACH) or the rate at which a volume of outdoor air enters per unit of time (cubic feet per minute, or cfm).

ZONE: The occupied space or group of spaces within a building, which has its heating or cooling, controlled by a single thermostat.

PHOTO # 1
PHOTOGRAPHER: TAR
DATE: 2/19/02
DESCRIPTION: View of the firing range, looking toward the entrance, in the basement of Building 9.

PHOTO # 2
PHOTOGRAPHER: TAR
DATE: 2/19/02
DESCRIPTION: View of the bullet stop in the firing range.

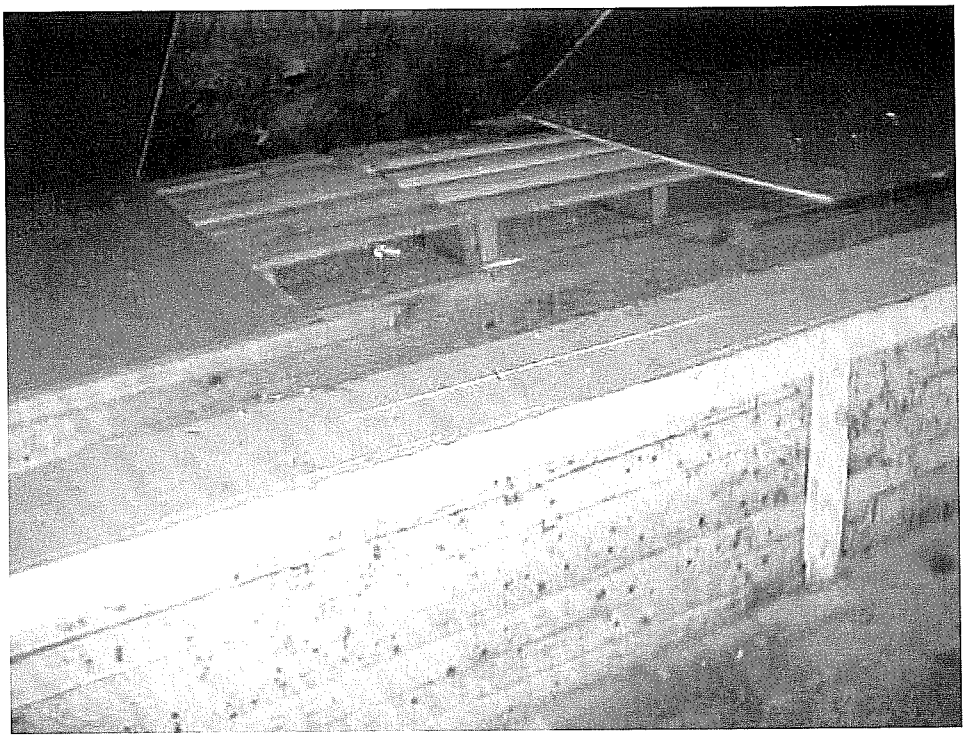

PHOTO # 3
PHOTOGRAPHER: TAR
DATE: 2/19/02
DESCRIPTION: View of the sand in the bullet stop in the firing range.

PHOTO # 4
PHOTOGRAPHER: TAR
DATE: 2/19/02
DESCRIPTION: One of the wall dust wipe sampling locations in the firing range.

PHOTO # 5
PHOTOGRAPHER: TAR
DATE: 2/19/02
DESCRIPTION: View of sampling activities of the ash in the smokestack ash clean-out room in the basement of Building 3.

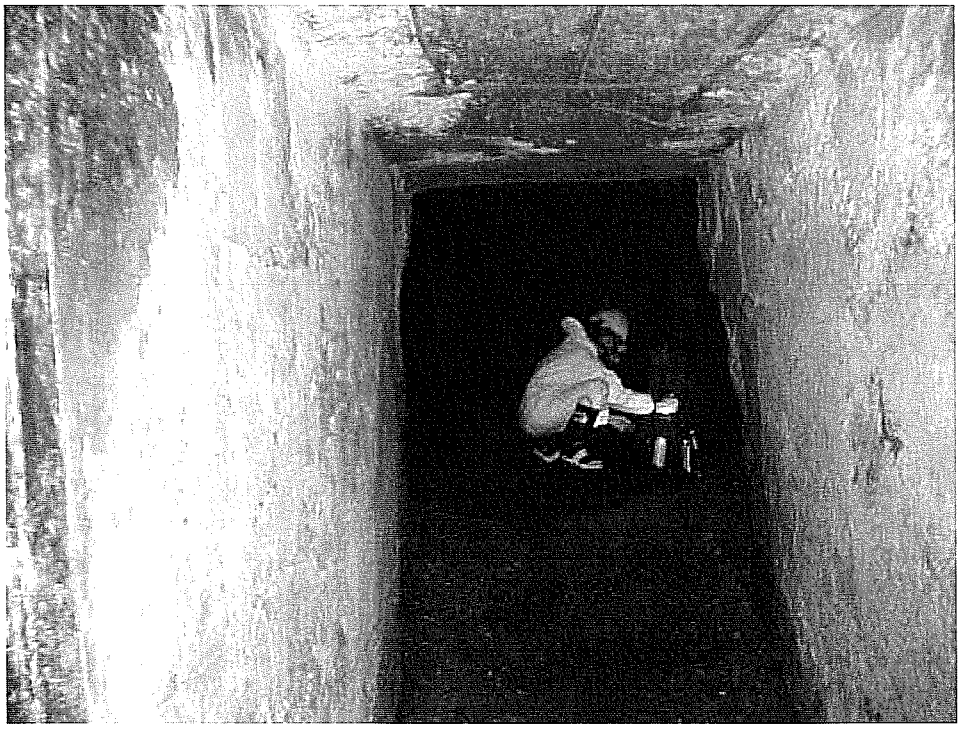

PHOTO # 6
PHOTOGRAPHER: TAR
DATE: 2/19/02
DESCRIPTION: View of boring advancement in the grass-covered area between Buildings 6 and 9.

Terracon
13910 W. 96th Terrace Lenexa, KS 66215
(913) 492-7777 (913) 492-7443

LEAD SAMPLE LOG

Location: Hardesty Federal Complex

Project No. 50017083 Date: 2/19/02 Sampled By: [illegible]

Sample No.	Sample Type	Description	Sample Area* inches	Comments	Lab Results µg/ft2
50017083-1	Wipe	Looking @ Range - Left 2' back	144"	1440398	42,000.0
-2	floor	" " " - Right 2' back	144	1440399	92,000.0
-3		Center 45' [illegible]	144	1440400	6,400.0
-4		Center 70' back	144	1440401	2,480.0
-5		Wall - Left 3' back	144	1440402	1,300.0
-6		" Right " "	144	1440403	280.0
-7		4 Pillars back (~70') floor	144	1440404	20.0
~~X~~		Left wall [illegible]	~~X~~		
-8		[illegible] (Right - [illegible])	144	1440405	10.0
		Analyzed:	JJM	2/25/02	

* For dust or mg/cm² paint chips

- Chain of Custody -

Client: Terracon Environmental Inc.
13910 W 96th Terrace
Lenexa, KS 66215

Phone: 913-492-7777
FAX: 913-492-7443

Special Instructions:

Project Name: ~~Rayne~~ Hardesty
Project No.: 5001083
Contact: Rayne or Tracie
Pager:

Type:

Asbestos			Lead			Other
[ ] Air	[ ] Soil		[ ] Air	[ ] Soil		
[ ] Bulk	[ ] Dust		[ ] Bulk	[ ] Paint		
[ ] Water	[ ] Other		[ ] Water	[X] Other	Wipe	

Analysis Method:

- [ ] PCM : NIOSH 7400
- [ ] PCM : OSHA
- [ ] PCM : Other
- [ ] AAS : NIOSH 7082 (Air)
- [ ] AAS : Lead in Drinking Water
- [ ] AAS : Lead in Paint ASTM D3335-85a
- [X] AAS : Lead Dust/Wipe
- [ ] AAS : Other Metals / Soil
- [ ] PLM : Bulk Asbestos EPA 600
- [ ] PLM : Point Counting 198.1
- [ ] PLM : NOB via 198.1 (PLM only)
- [ ] If <1% by PLM, to TEM via 198.4 to meet NYSDOH requirements **
  (**call to confirm TAT!)
- [ ] TEM : AHERA
- [ ] TEM : NIOSH 7402
- [ ] TEM : EPA Level II
- [ ] TEM : Microvac Dust
- [ ] TEM : Asbestos in Water
- [ ] TEM : Bulk Analysis
- [ ] TEM : NOB 198.4
- [ ] TEM : Other
- [ ] Total Dust : NIOSH 0500

Turnaround Time: FAX: _____ (date / time) Verbals: _____ (date / time)

[ ] 10 Day [ ] 5 Day [X] 72 hour [ ] 48 hour [ ] 24 hour [ ] 6 hour [ ] RUSH

Preliminary FAX/Verbal Results Requested by: _____

Sample Numbers: Client #(s): 5001083-1 (start) - 5001083-8 (end) LATL#(s): _____ (start) - _____ (end) Total: ___

Chain of Custody:

Relinquished:	W Gwenther	Date: 2/19/02	Time: 1615
Received:		Date:	Time:
Sample Log-in:		Date:	Time:
Sample Prep:		Date: 2/15/02	Time:
Analyzed:		Date: FEB 20 2002	Time:
QA/QC Review:		Date:	Time:

Archived/Released: _____ QA/QC InterLAB Use: _____ Date: _____ Time: _____